ABSTRACT

A method of forming SiBCN-based preceramic polymers or oligomers reacts a disilazane having the general formula $(R_3Si)_2NH$, where R is selected from the group consisting of vinyl, hydrogen, phenyl, and alkyls containing 1 to 3 carbon atoms with a boron halide including at least two halides, and a halosilane including at least two halogens at a temperature of between 125 C and 300 C. Upon partial pyrolysis, a partially pyrolyzed preceramic polymer or oligomer useful for burnable poison rod assemblies and spent fuel containers can be formed which provides hydrothermal stability and includes at least 3 wt % hydrogen.